J. New York Entomol. Soc. 95(2):338–340, 1987

NOTES AND COMMENTS

CHROMOSOME STUDY OF TWO NEOTROPICAL SPECIES OF GERRIDAE (HEMIPTERA: HETEROPTERA)

We report the chromosome numbers and sex determination mechanisms for males of two Neotropical genera of Gerridae (Hemiptera: Heteroptera), *Brachymetra* Mayr and *Tachygerris* Drake; this represents the first study of chromosomes in Neotropical gerrids. We also comment on the congruence between cytogenetic and morphological characters in the family.

Brachymetra and *Tachygerris* overlap in geographical distribution and they frequently co-occur in the same pools and streams (Calabrese, 1980). Two existing phylogenetic reconstructions for the Gerridae (Calabrese, 1980; Andersen, 1982), which are based on different sets of morphological characters, reveal the same clade placement for the two genera: *Brachymetra* is the sister-group of *Charmatometra* Kirkaldy and *Tachygerris* is in the same clade as *Gerris* Fabricius, a cosmopolitan genus. More synapomorphies define the clade which includes *Tachygerris* than define the clade which includes *Brachymetra*; neither genus belongs to a highly derived clade (Calabrese, 1985).

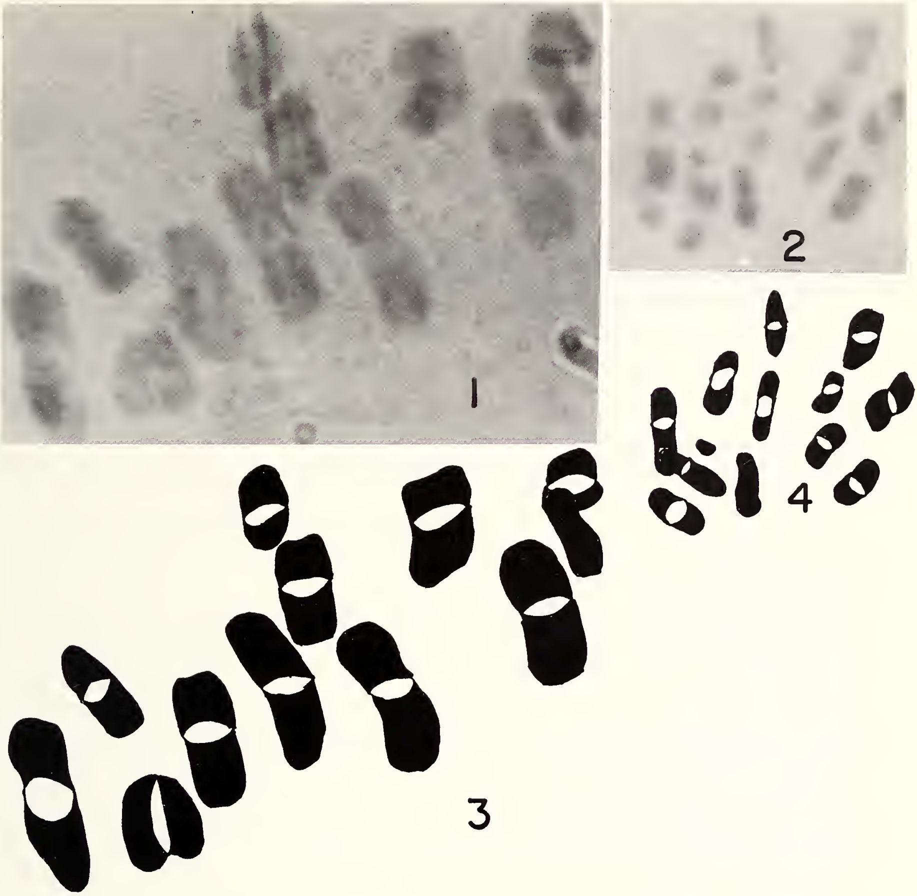
Specimens of *Brachymetra albinerva* Amyot and Serville and *Tachygerris opacus* (Champion) were collected on Barro Colorado Island, Republic of Panama, in March 1984. All adult males were fixed in the field in a 9:3:1 solution of absolute ethanol: glacial acetic acid: acetone (O'Rourke's fixative). Within a few months testes were dissected out, stained for approximately five minutes in a preparation of lacto-proprio-orcein, and squashed. Temporary slides were scanned under oil immersion for meiotic figures. Figures were photographed at 1,500× with a Bausch and Lomb Balplan phase-contrast microscope with a C-35 camera attachment. Figures were subsequently enlarged when prints were made.

Chromosome numbers and sex determination mechanisms can be summarized as follows (N, male): *Tachygerris opacus* (Figs. 1, 3) 11 + XO; *Brachymetra albinerva* (Figs. 2, 4) 11 + XY.

Kinetochores are restricted to the terminal ends of meiotic chromosomes in both taxa and m chromosomes are absent (Figs. 3, 4).

Chromosome sizes (lengths) range from 1.0 to 1.5 μm (Figs. 1, 2).

We have suggested elsewhere that the XY sex determination mechanism is ancestral within the Gerridae and that more derived groups exhibit higher chromosome number (Calabrese and Tallerico, 1984). We do not suggest there is consistency of chromosome number and sex determination mechanism within each genus. We do suggest, however, that when the results of the study of *B. albinerva* and *T. opacus* are considered within the context of existing phylogenetic reconstructions (Calabrese, 1980; Andersen, 1982), they corroborate our hypotheses: The less derived group, *Brachymetra,* retains an XY mechanism, heterogametic type, of sex determination;



Figs. 1–4. 1. Metaphase I. *Tachygerris opacus*; 1 cm = 1 μm. 2. Metaphase I. *Brachymetra albinerva*; 1 cm = 0.5 μm. 3. 'Bubble' diagram for Figure 1 to illustrate terminal kinetochores; 1 cm = 1 μm. 4. 'Bubble' diagram for Figure 2 to illustrate terminal kinetochores; 1 cm = 0.5 μm.

the more derived group, *Tachygerris,* exhibits an XO mechanism, heterogametic type, of sex determination. Neither group exhibits a total chromosome number which would be characteristic of a highly derived gerrid group. For example, species of the highly derived genus *Halobates* Escholtz exhibit diploid numbers of 30 + XO in the males (Newman and Cheng, 1983).—*Diane M. Calabrese, Department of Biology, Dickinson College, Carlisle, Pennsylvania 17013, and Peter Tallerico, Harrisburg Hospital, Harrisburg, Pennsylvania 17011.*

ACKNOWLEDGMENT

This work was supported by NSF grant DEB 81-16763 to D. M. Calabrese.

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